IN THE CLAIMS

1. (original) A method of optimizing the oxidation of molybdenite concentrates comprising:

a. forming an aqueous slurry of said molybdenite concentrates;

b. heating said slurry to a temperature of at least about 200°C;

c. agitating said slurry while in contact with an atmosphere containing free oxygen;

d. oxidizing said slurry in said atmosphere at an oxygen over pressure of at least about 50 p.s.i.;

e. regulating an ~~the~~ amount of ferric iron concentration and excess sulfuric acid concentration during the oxidation reaction; and thereby

f. producing a leach slurry wherein greater than about 99% of the molybdenum in said molybdenite concentrate is oxidized.

2. (original) The method of claim I wherein less than about 20% or greater than about 80% of said oxidized molybdenum is soluble.

3. (original) The method of claim 1 wherein said molybdenite concentrates contain copper and the copper dissolution is greater than about 99% in said leach slurry.

4. (original) The method of claim 1 wherein said molybdenite concentrates contain iron and the iron dissolution is about 60-90% by weight in said leach slurry.

5. (currently amended)The method of claim I wherein the regulating step maintains said slurry in a ~~relatively~~ high excess sulfuric acid level under conditions to produce lower soluble silicon levels.

6. (currently amended) The method of claim I wherein the regulating step maintains said slurry in a ~~relatively~~ high ferric iron level sufficient to accelerate the rate of oxidation.

7. (original) The method of claim 1 further comprising recycling a portion of said

leach slurry produced in st p (f) back to the forming step (a).

8. (currently amended) The method of claim 7 further comprising determining an approximation of the amount of soluble molybdenum in the leach slurry.

9. (currently amended) The method of claim 8 wherein the determining step includes ~~is accomplished by~~ monitoring a concentrate analysis, a recycling solution analysis, and pulp density.

10. (original)The method of claim 1 wherein the oxygen over pressure in the oxidizing step reanges for about 80 to about 120 p.s.i.

11. (original) The method of claim 1 wherein the temperature in the heating step ranges from about 210 to about 220 °C.

12. (withdrawn) A method of predicting the soluble molybdenum present during the pressure oxidation of molybdenite concentrates comprising:

a. determining an approximation of the excess sulfuric acid concentration; and

b. determining an approximation of the soluble iron concentration.

13. (withdrawn) The method of claim 16 wherein the determining step (a) is predicted from the concentrate weight and analysis plus the recycled solution volume and analysis.

14. (withdrawn) The method of claim 16 wherein the determining step (a) further comprises:

a. effecting a preliminary calculation of the excess sulfuric acid concentration; and

b. refining said preliminary calculation by one or more further calculations wherein

the excess sulfuric acid concentration value is corr cted to compensate for additional molybdenum precipitation.

15. (New) The method of claim 7 further comprising determining an approximation of the amount of ferric iron concentration and excess sulfuric acid concentration.

16. (New) A method of oxidation of molybdenite concentrates, comprising:
   a. regulating an aqueous feed slurry of said molybdenite concentrates with at least one of water, a recycle solution and slurry,
      wherein a soluble molybdenum in the final leached slurry is predicted;
   b. calculating an approximation of an excess sulfuric acid concentration, a soluble iron concentrate and the soluble molybdenum concentration in the final leached slurry;
   c. adjusting the recycle solution based on the calculation;
   d. oxidizing said feed slurry by heating to a temperature of at least about 200°C, while agitating said feed slurry in contact with an atmosphere having an oxygen over-pressure of at least about 50 p.s.i.; and
   e. thereby producing a leached slurry wherein greater than about 99% of the molybdenum in said molybdenite concentrates is oxidized.

17. (New) The method of claim 1 wherein the calculating step (b) further includes determining a preliminary calculation of the excess sulfuric acid concentration.

18. (New) The method of claim 1 further comprising refining said preliminary calculation by at least one calculation wherein the excess sulfuric acid concentration is corrected to compensate for an additional molybdenum precipitation.

19. (New) The method of claim 1 further comprising monitoring the excess sulfuric acid concentrate and the recycle solution analyses; and

regulating the amount of at least on of the recycle solution, the slurry added to th feed and the pulp density of the feed slurry so that the desired amount of molybdenum will be in a soluble form in said leached slurry.

20. (New) The method of claim 1 wherein less than about 20% or greater than about 80% of said oxidized molybdenum is a soluble form in said leached slurry.

21. (New) The method of claim 1 wherein said molybdenite concentrates include copper and greater than about 99% of the copper is soluble in said leached slurry.

22. (New) The method of claim 1 wherein said molybdenite concentrates include iron and about 20-30% of the iron is soluble in said leached slurry.

23. (New) The method of claim 1 wherein the regulating step includes generating a feed slurry that produces said leached slurry containing an excess sulfuric acid level, greater than 60 grams per liter, thereby producing low soluble silicon levels.

24. (New) The method of claim 1 wherein the regulating step further includes recycling of at least 0.25 moles of soluble ferric iron per mole of molybdenum in the feed concentrate to maintain the oxidizing slurry at a relatively high ferric iron level to accelerate the rate of oxidation.

25. (New) The method of claim 1 wherein the oxygen over-pressure during the oxidization step ranges from about 80 to 120 p.s.i.

26. (New) The method of claim 1 wherein the temperature during the oxidation step ranges from about 210°C to about 220°C.